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NOTICES.

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Editorial communications must be addressed, **J. HAY TAYLOR**, Advertisements and business communications to **Jos. T. Smith, Secretary, Magic Lantern Journal Company, Limited, 9, Carthusian Street, London, E.C.**

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NOTES.

Eastman Company's new Wholesale Premises.—This company has taken the large premises at 43, Clerkenwell Road, having three floors with a total area of 16,000 square feet. The wholesale premises and general offices have been moved from 115-7, Oxford Street, which place will in future be confined to the retail business only.

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Pure Water.—The chairman of the Grand Junction Waterworks Company states that the Thames water as supplied by his company is so pure that in order for a person to imbibe one grain of suspended matter it would be necessary to drink about 25 tumblersful per day for a period of five years.

◆ ◆ ◆

A. Clarkson & Co.—Mr. A. Clarkson has admitted two partners into his business at 28, Bartlett's Buildings, E.C., in equal shares, and the owners now consist of A. Clarkson, Robert Broadhurst (who has been manager for several years), and W. H. Towns.

Cinematograph Fire.—On the 3rd ult. considerable excitement was caused at a cinematograph exhibition at Bolton, in consequence of a fire which broke out in connection with the electric light used in the lantern. The hall was crowded and the audience made a rush for the exit, but although several persons were knocked down, no serious damage was done. The operator, however, was burned about the hands.

◆ ◆ ◆

A Hole in a Rubber Tube.—The *Eastbourne Gazette* had occasion to announce on the 12th ult. that a lantern lecture had to be postponed in consequence of an imperfect piece of rubber tubing, and it certainly did so in style. About two inches were taken up with four headings displayed in different type in as prominent a position as one could expect had there been an earthquake which had swallowed up half the town. The headings were: "A lecture postponed.—The lantern apparatus fails.—It was not in beautiful working order.—A rubber gas pipe bursts," followed by the following information:—The Rev. John Turner (Southdown College) was announced to give a lecture at the Pevensey Road Congregational Schoolroom last (Tuesday) night on "The story of the Pilgrim Fathers." By 8 o'clock the building was well filled by an audience consisting largely of the rising generation. Arrangements had been made to show 48 views, and a large lantern apparatus had been put up. Unfortunately it was not—as the song has it—"in beautiful working order." Unavailing attempts were made to render it capable of performing the service expected of it. But instead of doing so it cast on the sheet only confused and blurred images. At the request of Mr. J. J. Saunders, the boys sang two or three hymns: "Stand up! Stand up for Jesus!" "Hold the Fort," and "There is a green hill." It was found impossible to use the lantern. Mr. Turner stated that the india-rubber gas pipe had burst. After waiting about half an hour some of the audience left.

◆ ◆ ◆

81, Aldersgate Street.—Messrs. Adams & Company, who have for several years occupied the premises at 81, Aldersgate Street, E.C., have lately given up that branch, and removed to their headquarters at 26, Charing Cross Road. The premises vacated have again been occupied as a photographic store, this time as a branch of the City Sale and Exchange Stores.

Ortol.—Mr. Chas. H. Bothamley, F.I.C., F.C.S., F.R.P.S., has made some extensive experiments with the new developer Ortol introduced by Messrs. Fuerst Brothers, and in the course of his report says:—"I find Ortol to be a developer which is energetic and acts rapidly, but at the same time is well under control. In its mode of action and the manner in which the image appears, it closely resembles pyro-soda, but the half-tones and shadows follow the high lights rather more rapidly than with metol and similar developers."

◆ ◆ ◆

Slides of Australia.—The Agent-General for Western Australia is about to issue lantern slides of Australia to such school masters in this country as are prepared to deliver lectures to their pupils on the colonies.

◆ ◆ ◆

Preservation of India-rubber Tubing.—The *Photo Times* states that rubber tubing may be prevented from getting stiff when not in use by giving it a coating of stearine obtained from a hard stearine candle.

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The Lumiere Cinematograph Camera.—Messrs. Fuerst Brothers have made a reduction in the price of the Lumiere cinematograph camera (which is capable of photographing, copying, projecting, and reversing animated pictures) to £40. The apparatus is an excellent one.

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Scripture Lantern Slides.—The wonderful drawings of Professor Hoffman, perhaps the most exquisitely beautiful series of pictures ever published of the "Life of Christ," are now obtainable as lantern slides. They are 30 in number, and the owner of the copyright will only allow them to be sold in complete sets at £10 per set. They are published by Messrs. Newton & Co., of 3, Fleet Street, who, we note, have also added over 100 new slides to their scripture series, which are sold at 1s. each; many of these are very beautiful. They also issue a series of 24 slides (costing 24s.) on "The Passion of our Lord," which is particularly applicable for Easter time.

◆ ◆ ◆

International Photographic Exhibition.—The Royal Photographic Society is organising an International Exhibition of photographic apparatus and photographs which will open at the Crystal Palace on April 27th. In addition to the usual displays of pictures, etc., the leading firms, manufacturers and dealers will be largely represented. There will also be extensive loan collections, illustrating not only the history of photography, but its enormous scientific and commercial applications, photo-mechanical processes, photographs in colours, photographs by means of the X-rays, and kindred exhibits. The exhibition, the arrangements for which are in the hands of a joint committee of members of the society and exhibitors, bids fair to be the largest and most interesting collection dealing with photography which has ever been got together.

* * *

Blackboard in the Pulpit.—Evidently the Rev. Dr. W. E. Needham, of Brooklyn, U.S.A., has "gone one better" than the lantern in church, for he emphasises his sermons by sundry lightning sketches on a blackboard.

* * *

Gwyer Jets.—A new form of this jet is on the market, and we hope to give particulars in our next issue.

Viewing Film Transparencies in the Cinematograph Without Projection.—No. II.

WITH reference to the methods of inverting the image, which we described in our last issue, the following, though perhaps not so satisfactory as the use of a prism, gives fairly good results. A thin glass mirror is all that is required; this is simply held in front of the objective, as shown in the illustration, when, if a person standing in front of the lantern looks down in the mirror, the pictures will appear the right way up. Glass or metal, silvered on the surface prevents all chance of double reflection, hence are superior to ordinary looking glass.

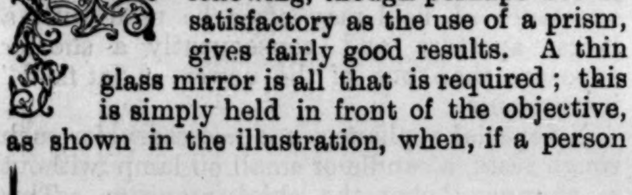

FIG IV

Water Pressure.

A CORRESPONDENT writes:—"I have several times seen it stated in the MAGIC LANTERN JOURNAL that gas was used at so many inches pressure. I am totally unacquainted with the meaning. It is possible that many other readers may also like to be enlightened, so perhaps you would inform us in your Notes and Queries Column." This subject being one which cannot well be explained without a diagram, we will describe it in the form of a short illustrated article instead of replying to the question in the usual column.

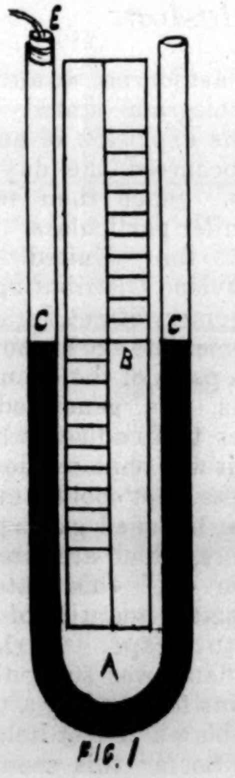

FIG. 1

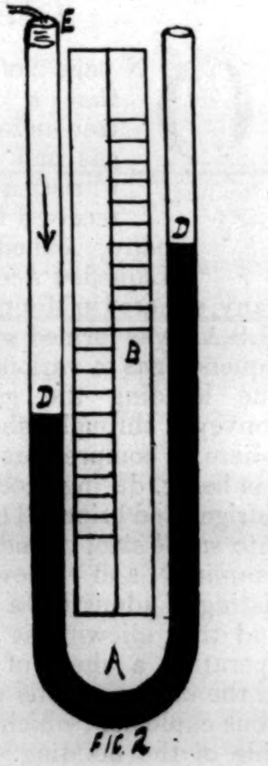

FIG. 2

When gas is spoken of at so many inches pressure the term water pressure is understood, and this is calculated according to the distance that the pressure of gas will force a column of water in a tube bent in U shape. The following sketches will better illustrate our meaning. Fig. I. represents the bent glass tube A, into one end of which is inserted a cork carrying a smaller tube, so that the gas can be connected therewith. Water (which is represented at the black portion) is poured into the tube at the open end. A scale, as shown, which we will suppose to be divided into inches, is placed so that the zero, is at the junction of the two side scales immediately opposite the water, the two columns of which will be level (as at C C). If the gas piping be connected at E, and pressure admitted, the water will be forced down the pipe at one side and up the other, as shown at D D, Fig. II. The pressure is read from the scale by calculating the difference between the two levels. In this diagram the fall and rise are both 4 inches, so the difference between the two must be 8 inches, which gives the water pressure of the gas under the circumstances stated.

The Jersey City Acetylene Explosion.

ON page 2 of last journal we announced that a telegram stated that a tremendous explosion of acetylene gas had occurred the day before Christmas. Since then we have received fuller particulars. A company called the United States Liquefied Acetylene Distributing Company, situated in Montgomery Street, Jersey City, U.S.A., was formed some time ago for supplying liquefied gas to various parts of the country. In one building the gas was generated, then conveyed through tubes to an adjacent building where by compressors it was rendered liquid, the gas being, during process, kept cool by means of refrigerated brine. The liquefied gas is pumped into small steel cylinders, which are previously examined and "blown off," this latter consisting of admitting a small quantity of the gas and then allowing it to escape. During this operation a sheet of flame was suddenly seen in the room and this was followed by a tremendous explosion, which blew a 20 feet hole in the side of the building. So far this seemed the extent of the damage, but a few minutes later a series of explosions took place, the last of which blew the factory to pieces and set fire to the ruins. Houses, which were adjoining, were greatly damaged, and there was great consternation in the neighbourhood.

The firemen were placed at a great disadvantage, for the water supply acting on the large quantity of calcium carbide in stock, at once generated more gas to feed the flames. The loss in connection with the Acetylene Works is estimated at about £5,000, but the loss in connection with the wrecking of adjacent buildings which has not yet been computed, is said to reach a very large figure.

Some Simple Lens Tests.

By EDGAR CLIFTON, F.R.P.S.

IT cannot fail to strike even the least observant that while our exhibitions are full of pictures in which, to put it mildly, sharpness of definition is not the most pronounced characteristic, our opticians are nevertheless urged to produce still more optically perfect instruments. A little astigmatism, more or less, would certainly make but little difference in the artistic effects of the modern school, and yet there is a great and growing demand for stigmatics, anastigmats, collinears, planars, and the like. This must be taken as an unmistakable sign that the bulk of photographers still respect the exquisite power of rendering detail, which one of our most talented teachers has termed the photographer's birthright.

Now, a winter's evening may be profitably spent in ascertaining the true capabilities of such lenses as we possess, and making notes of any peculiarities which may be detected, with a view to subsequent work. For example, a lens which has an amount of

spherical aberration

sufficient to render it useless for rapid work with full aperture will probably be found to yield softly defined and pleasing images when used for portraiture. Again, flatness of field is a most desirable quality for most subjects, but for many interior views a lens with great curvature of field may often be used with a larger aperture and consequently a shorter exposure than one of the newest "flat field" instruments.

No special appliances are necessary for such rough tests, a candle or small oil lamp without a chimney being the chief requisite. This should be placed at a convenient height, say 4 feet from the floor, upon a shelf, chest of drawers or other suitable support, a black focusing cloth being tacked to the wall behind it to avoid reflections which might be found misleading. The camera with its lens attached should be fastened upon its stand as usual, leaving the screw slightly loose, so that the camera may be rotated, turntable fashion, without disturbing the stand. The camera should be placed as far as possible from the light. If the distance be less than 10 or 12 feet the consequent lengthening of focus on the camera side of the lens will somewhat interfere with the accuracy of the observation.

Curvature of Field.—Having made a mark in the centre of the focusing screen, focus the image of the candle flame sharply upon it. By slowly rotating the camera upon the tripod screw, the image may be made to approach the margin of the plate; the point at which the sharpness of definition is appreciably lessened should be noted, and a careful measurement of its distance from the centre noted. Other things being equal, the longer this distance is the better the lens. With an aperture of $\frac{f}{16}$ there should be little falling off in sharpness even at the edges of the plate, which the lens in question is supposed to cover. If possible, a lens of similar type by a maker of reputation should be used as a standard of comparison; it will on the one hand show how much may be reasonably expected of a lens, and on the other will prevent the observer from being satisfied with the performance of an indifferent instrument.

Astigmatism.—This is a more serious defect than curvature of the field. It is difficult to briefly explain its character, but it may be said to be an inability to give a sharp image at or near the margins of the plate. The test is very similar to that for curvature, but the difference between that defect and astigmatism is very easily detected; if the blurring at the margins be due to curvature of the field, it will disappear on racking in the camera so as to slightly shorten the focus. It may also be cured by reducing the aperture of the lens, but neither of these expedients avail if the astigmatism is present. It may readily be identified by means of a test diagram, which may either be two sets of **ruled parallel lines** say $\frac{1}{16}$ inch thick and 4 inches long, one set being placed horizontally and one vertically, or it may be a number of concentric circles, such as the enterprising soap makers were wont to tire our eyes with a year or two ago. If both sets of lines and the entire circumference of the circles are uniformly defined then astigmatism is absent. Astigmatism may be mitigated by using a small stop, but once present can never be entirely removed. The difference between the best of lenses of the rectilinear type and those of the anastigmatic, or as they are more correctly termed stigmatic, form is most striking.

Flare Spot.—This is a defect which is frequently present, even in lenses by good makers, and is often not discovered by their owners until after years of use. It is the tendency when photographing a brightly lighted object, such as a church window or even a white shirt front, to produce a more or less blurred secondary image in an inverted form. It may readily be detected by focusing the candle flame accurately upon the centre of the ground glass; if a flare spot be present, it will, on rotating the camera, be seen to leave the centre on the opposite side from that of the real or primary image of the flame. It may be a dimly lighted but sharp image of the flame, or it may be a circular disc or ring. It may be modified in character or entirely removed by altering the distances between the combinations of a double lens or by altering the position of the stop of a single one. It is usually more noticeable when using a small aperture, and it is frequently found in portrait lenses when they are stopped down with a view to using them for landscape work. It is unfortunate that this defect usually occurs in rectilinear lenses when the distance between them has been so adjusted to obtain the best results so far as definition, flatness of field, etc., are concerned.

Spherical Aberration is a fault inherent in most forms of single lens and occasionally met with in double ones; it may briefly be described as an inability to give sharp definition when the lens is being worked at a large aperture. It is readily detected by focusing the **candle flame** and noticing whether it is surrounded by a slight halo or blur—this will disappear on reducing the aperture, and the largest size of stop at which the defect is removed should be noted, and this size should not be exceeded if perfect sharpness be a desideratum. In portraiture, spherical aberration is often purposely introduced to give a generally "soft" effect.

Rectilinearity, or the power of reproducing straight lines, may be tested for by ruling some bold lines upon a card, and focusing them upon the margins of the ground glass upon which a pencil line should also be ruled; by bringing the focused line upon the pencil line the amount of deviation from truth can readily be seen. It is surprising how little curvature of marginal lines will be found, even when using a single lens, if the focal length be over one and a quarter times the length of the longest side of the plate.

Chromatic Aberration, or a want of coincidence of the actinic and visual images, is rarely found in modern lenses, unless they are of the periscopic type, in which for cheapness, simple or uncorrected lenses are employed. This is readily detected by the optician, but the tyro will find it necessary to make an actual photographic test, which may easily be done by placing a large newspaper page in a sloping position in front of the camera, and focusing sharply upon the central letters. A plate must now be exposed and developed; if the lines focused upon are the sharpest in the negative the lens has been properly corrected for colour. The exposure may easily be made at night by burning a few inches of magnesium ribbon in such a position that the lens is screened from the direct light of the actual flame. When making this test it is advisable not to focus upon the usual focusing screen, but upon a piece of ground glass placed in the dark slide to insure its being in the actual position which will be occupied by the plate. If after focusing upon this the image upon the ground glass is perfectly sharp, it will also have proved that these register accurately, a point of no small importance.

There are other defects to be found in lenses, most of which require a trained eye and some special apparatus to detect; these must be neglected by the amateur, but he may feel assured that if his lens or lenses will stand the tests given in the preceding pages, he need have little anxiety as to how they will behave in actual work.

* * *

Acetylene Gas Buoy for New York Harbour.

We have, says the *Scientific American*, been favoured by Lieut.-Col. D. P. Heap, Corps of Engineers, United States Army, with the particulars of an experimental acetylene gas buoy which he has designed for river and harbour service. The new buoy, in addition to being more powerful and economical than the electrically-lighted buoys, is more reliable. If one of a chain of the latter goes wrong, all the others are affected; whereas the acetylene buoy, being an independent and self-contained unit, will not affect any other buoys by its failure. In order to save expense in carrying out the experiment, a first-class can buoy was pressed into service and modified for the test (see accompanying engravings). A cylinder, CC, of boiler iron, closed at the bottom, but open at the top, was attached to the diaphragm, D, of the buoy, and firmly supported at the lower end. In this cylinder were placed and securely fastened three tanks, TTT, containing each about 20 lbs. of liquefied acetylene gas under a pressure of 600 lbs. to the square inch. These three tanks are connected by piping to the regulator, R, which reduces the pressure to that of a 2 inch water column.

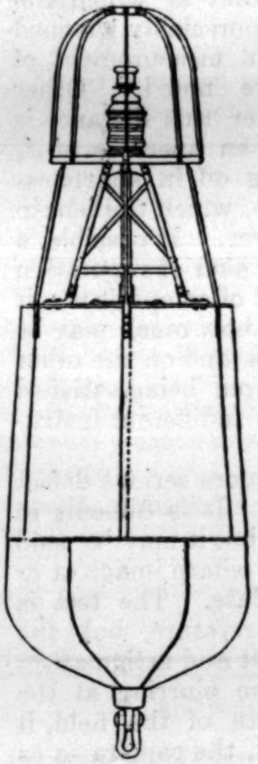

Fig. I.—Elevation of the acetylene gas buoy.

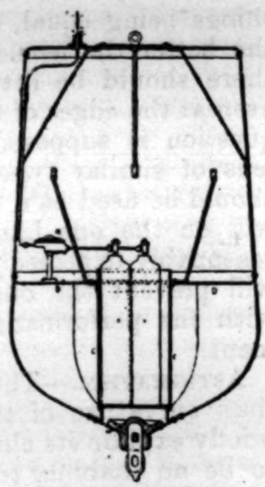

Fig. II.—Vertical section.

From the regulator a pipe leads to a Naphey burner, so placed that the flame will be in the focus of a lens-lantern provided with cut-glass prisms, so as to concentrate the light in a horizontal plane. The candle-power of the burner is 25. This is increased by the lens-lantern, so that the emergent beam is about 230 candle-power.

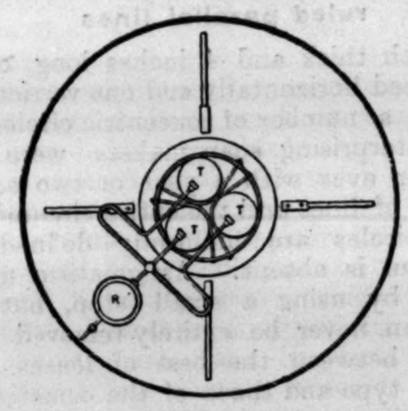

Fig. III.—Horizontal section above tanks.

One pound of liquefied acetylene will expand to 15 cubic feet of gas; so the charge in this buoy equals 900 cubic feet. As the burner consumes a little less than 1 cubic foot per hour, the buoy should burn continuously for at least 900 hours. On October 30th the buoy was lighted and placed in the water near the north dock at the lighthouse depot. It burned continuously until November 10th, when it was taken up and placed next day near Bay Ridge for convenience of examination by the Lighthouse Board. On the 12th it was replaced in its former position, and continued to burn brilliantly until November 26th, when the light began to grow less bright. The buoy was taken up, and an examination of the burner showed that carbon had deposited at the orifice. This was probably due to the burner being defective as other burners of the same type had given far better results. The cost of the gas consumed in this trial was about 1 per cent. per hour, which is a remarkably low figure, especially in view of the brilliance of the light. Experiments have also been carried out with liquefied acetylene gas for beacon lights, and it gives promise of equally good results in this direction.

The Lighthouse Board considers these tests so successful that additional and more severe experiments are to be made with an acetylene gas buoy moored near the entrance to Gedney's Channel, and with an acetylene gas-lighted beacon on Romer Shoal. The same buoy will be used, such modifications being made as have been suggested by the Bay Ridge experiments.

The two principal advantages which would obtain if this method of lighting proves, after extended trial, to be successful and practical, are, first, large reduction in first cost of gas-lighted buoys; and, second, large increase in the power of the light.

The Lanternist's Practical Cyclopædia.—No. XVI.*

By CHARLES E. RENDLE.

Lever Slides.—*See* Double Motion Slides.

Leyden Jar.—A glass jar with wide mouth, coated nearly up to the shoulder, both inside and out, with tin foil, whilst the covering for the neck is made of wood, or other insulating material. It is used for accumulating electricity, which is passed into the inside coating through a metal rod which passes through the lid. On the top of the rod is a brass knob, and to the other end is attached a chain which falls to the bottom of the jar and is brought into contact with the metallic coating internally. The coating is charged with electricity through the knob, whilst the outer coating is charged with an opposite energy which is in contact with the glass. The internal and external charges attract one another until the jar is fully charged. Electricity is accumulated in this way in greater quantities than in the prime conductor. The Leyden jar was invented by Cunens, in 1746, in the town of Leyden, in the Netherlands, from whence it takes its name.

Life Model Slides.—Within the last few years much interest has been infused into many stories, poems, etc., by showing scenes, and so forth, illustrative of the argument, and photographed direct from the animate, in place of, as heretofore, the inanimate. By the grouping of living figures to portray the sense spoken, at once makes the story natural and more realistic, and therefore slides from life models are most popular.

Light.—Generally associated with heat, and is seen in all solids and liquids when heated to a degree approaching intensity. Newton considered that white light consisted of seven different species of coloured light combined together, namely red, orange, yellow, green, blue, indigo, and violet; but it is now accepted that white light is made up of three varieties of coloured lights, red, yellow, and blue, as all tints can be made or produced by these three. The influence of light upon chemical action is beautifully brought out in the Daguerreotype; and from which emanates the base of photography.

Lime, or Oxide of Calcium.—An alkaline earth obtained by heating limestone or chalk in bulk. Decomposition of the carbonate of calcium sets in on applying the heat, the gas, carbonic acid, is sent off, whilst quicklime or oxide of calcium remains. The limes cut specially for limelight purposes should be carefully kept aloof from atmospheric influences.

Lime Cylinders or Holders.—These are air-tight cases, generally made of brass, for the storing and better preservation of limes. Some time ago Mr. J. Hay Taylor invented a means for protecting limes by enclosing them separately in glass globules or tubes, which, when hermetically sealed, totally excludes the air or other deleterious matter from affecting them. Lanternists are recommended to try these, which are now obtainable from dealers in limes.

Limelight.—Known also as the oxyhydrogen light, and is obtained by directing an oxyhydrogen flame on to a ball or piece of quicklime, when an intensely brilliant light is the result. In the first form of limelight, or Drummond's light, a stream of oxygen was directed through a spirit flame on to the lime by means of a specially constructed lamp.—*See* Oxy-calcium Lamp.

Limelight Box.—Principally used for theatrical purposes, and consists of a box containing the jet and which is fitted with a condenser. The whole thing is made to swivel, that it may be placed at any angle.

Limelight Portraiture.—Portraits taken by the aid of the limelight.

Lime Tongs.—All using the limelight should provide themselves with a convenient appliance for manipulating the limes when heated. For the purpose a small pair of tongs is found best. These may be either purchased or made from stout brass wire.

Litmus-Paper.—Unsized paper dipped in litmus, and when dry can be used as a delicate test for acidity.

Lucigraph.—A marine signalling apparatus. By the aid of an optical lantern the machine, which has an arrangement somewhat similar to the typewriter, and with the international code letters, is worked. The signals are projected on to a portable screen, fitted up in the bow of the ship. These signals can be seen at a distance, according to the power of the luminant used and the clearness of the night.

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Luminant.—*See* Illuminant.

Lyceum. — A place of instruction by lecturing, an assembly of improvement, etc.

Magic and Magical Effects by the aid of the optical lantern are those changed—and seemingly to the uninitiated—super-human actions, which are simple in achievement to all with a knowledge of the optical lantern system.

Magic Lantern.—As to who the actual inventor was of the optically arranged instrument by this name, history is too conflicting to arrive at any definite conclusion. Writers have ascribed it to various personages, from one Roger Bacon, A.D. 1250, and to many others extending over 400 years, until we are brought to the time of Athanasius Kircher, who lived 1620 to 1680. It would seem at even a later date than that above named—indeed, it may be stated with all safety, that the present century was fairly under way before the magic lantern was regarded as anything but the veriest of scientific toys. During the past 50 years, however, inventors and improvers have gone on adding to its uses and utility, giving us instruments of every possible description, some with the very ugliest unpronouncible names that can be conjectured, many with mechanical attachments of such a high standpoint of accuracy and completeness that enables the technical educationalist to teach and present his views in a lucid, graphic, and simple way, that without such aid would be impracticable. But as the subject is the one of all others that the pages of the Optical Magic Lantern Journal are entirely devoted to, and, moreover, it being the purport of these articles to discuss briefly *ad valorem* its merits or demerits, it would seem superfluous to dwell upon them here, further than to direct the attention of the reader to the literary matter referred to above, the term Magic Lantern being the pivot upon which the whole of such matter is centered.

Magnetic Curves are shown with much interest in the science lantern, the movements of the iron filings essentially used in the slides and experiments in their transit through the lines of force being highly diverting.—*See* also Magnetism.

Magnetism and Magnets.—That scientific branch which treats primarily of magnetic phenomena, the powers and properties of magnets, etc. Magnetism and electricity have a close affinity to each other. The earth is a great big magnet, and from it all lesser magnets are induced or made. The strongest of magnetic ores is the valuable iron oxide known as magnetite, popularly called in ancient time, loadstone, lodestone, or leading stone; the latter term, no doubt, derived from the fact that it was used as a compass by navigators of early times. Most readers have gleaned from their school books that a magnet may be made by placing a length of flat steel in proximity to the earth, and by giving it a sharp blow in the middle with a hammer, it becomes a magnet. A. P. Laurie, Esq., M.A., D.Sc., Professor of Electricity and Magnetism, University Lecturer, etc., informed the writer that this is so. But a permanent magnet can be prepared by simply taking a piece of bar steel—not iron—and by stroking it at one or both ends a few times with a magnet it becomes magnetised. The steel draws the magnetism from the higher power magnet. Experiments may now be performed by the aid of this new bar magnet in the degree that it possesses the properties of magnetism, and by balancing it on a needle or pivot, one end will at once swing round to that point of the earth's surface known as the North Pole. This end of the magnet is therefore called the N.P. or North Pole, and the reverse end the S.P. or South Pole. By taking a second magnet, and by placing the two north poles together, it will be found they repel each other. Next place the two south poles together, and it will also be found that they, too, repel each other. Now allow each to swivel on its pivot and take its natural course. The south pole of one will swing round to the north of the other, thus proving they attract each other, and that the north pole of each magnet points to the north of the globe. These simple facts form the fundamental base of magnetism.

Management of Lantern.—*See* Lantern Manipulation.

Manganese.—Known to the lanternist as peroxide or black oxide of manganese, and used largely in making oxygen gas. It is the most important of the compounds that present themselves in combination in many minerals. The metallic element, for such it is, is the main factor in many important manufactured preparations, and for bleaching and disinfecting purposes it is invaluable.

(*To be continued*)

A Little Information about the Cinematograph.—No. II.

By W. C. HUGHES.

DURING the change of films it is better to interject an art picture either from a separate projecting lantern or alternately in the machine itself fitted with such an arrangement, because it is unwise to leave an audience in darkness, neither is it desirable to give them the full glare of light from the body of the hall, or it will be difficult to see the cinematograph pictures. After it has been fixed on the sprocket wheel ready for transmitting to the screen, a number of films must be ready to prevent waiting, or they can be joined together and shown simultaneously one after the other. The joint is made by scraping the gelatine from the surface of one film, and painting the bare celluloid both of this and the piece to which it is to be joined with acetone solvent, and when the surfaces so treated are placed together and pressed with a proper pressing machine they will stick firmly together. A good machine for doing this can be purchased for 30s. The illuminating medium is a very important factor in producing the animated pictures on the screen. The electric light, if available, is the most powerful, the limelight undoubtedly comes next, and with a properly constructed mixed gas jet, a suitable condenser and front lenses, a most satisfactory result can be obtained. By this means a picture can be produced 16 feet square from the standard sized films, which are only 1¼ inches wide. This, of course, is very remarkable since this little picture can be magnified over 20,000 times if desired, and yet look well. No one should show less than a 10 feet picture, and this not too close to the front seats.

The next important features to consider are the celluloid films and their perforations. These can now be had by the thousand, there being a great variety of subjects; but the next point to realise is to obtain good attractive subjects, well exposed, well developed, and well toned, also true Edison gauge. Hundreds of these films published in France, Germany, etc., are catalogued as Edison gauge, but when accurately tested are not so. Just a little out will spoil the entertainment; if the perforations are not accurate to a nicety they will jump up and down and not produce the true

living movements.

Many foreigners seem to have a difficulty in gauging these correctly. They get fogged in their calculations of centimetres and inches, neither do they allow sufficiently for the shrinking of the film during the process of developing. However, in order to obviate this use another sprocket wheel to suit the foreign gauge, which can be fixed in less than a second on a properly constructed machine, of which there are very few, without interrupting the performance, therefore the Edison or any other gauge can be adjusted to the same machine during the exhibition. This is very important, as some of the French films are the best for character and animation of any published.

Take notice also there are hundreds of films published not worth the emulsion surface they are printed on, and are dear at any price, being dense, unartistic, and non-characteristic pictures.

Exhibitors have many a time and oft, through trusting to inexperienced dealers, to deplore a failure consequent upon investing in worthless productions, which are not only bastard gauge, but badly-conceived illustrations of living subjects.

The title, no matter how attractive it may appear, is no warranty whatever of the film's general beauty and effect. The writer, however, is very particular in this direction; after having waded through dozens of films, testing them in the machine itself, retains only those that are good; the others are thrown on one side in order that he may rely upon every film being attractive with either true Edison or French gauge.

Having explained these points, the next for amateurs and exhibitors to consider, should they care to do so, is

How to take the Living Pictures and Develop them.—This is by no means a difficult task. There are several good cameras on the market. The taking and developing same—very simple. To expedite matters, amateurs should buy their films already perforated. The only thing to be done is to place one in the camera inside dark-room, close it up, then take camera and point it to the object or objects you intend to take, having previously fixed it on a solid stand, turn the handle at the rate according to the movement of the object being taken, and it is done. A little practice with bromide paper will help the novice, which can be developed in the ordinary way, and show the operator where he is at fault, as this saves at first spoiling a celluloid film. Supposing a subject has been taken successfully, you remove it to the dark-room, where you have suitable apparatus for developing the film. The simplest and best known being the following:—After removing it from the camera wind it round a large drum or metal cylinder, about 3 feet long and 12 inches in diameter. This is pivoted at the centre, and revolves in a wooden bath lined with metal, which contains the ordinary developer, the usual pyro-soda being the most suitable and least expensive. After being satisfied that the film is

properly developed,

wash it under the tap with clean water for five minutes, revolving it all the time, then place the cylinder in another bath containing hypo, revolve this also for about 15 to 20 minutes until it is fixed, then place it in another bath under the tap or taps so arranged that a good flow of water runs over the entire length of the cylinder; by again revolving this for about an hour, it is ready for drying, which is accomplished by removing the film entirely from the cylinder, and placing it on a number of pegs, celluloid side down to prevent injury to the sensitive portion. When thoroughly dry, it can be rolled up ready for the projecting machine. The process is exceedingly simple, and amateurs need not fear trying their hand in this direction. The requisite apparatus for this process, viz., the cylinder and three baths, costs about £6 10s.

After the films are boxed, store them in a suitable place not too dry, a slightly damp corner is the best, otherwise the emulsion film may peel off.

In order to project films, and to take by the camera negative films thoroughly satisfactorily, do not attempt it with a double apparatus or projecting machine and camera combined, this would cause anxiety. For instance, although some of the cameras will act as a projector, to do so it has a shutter, therefore you get the usual flickering; moreover, it would take time to convert it, and then not answer so well or so perfectly as a specially constructed projecting machine. It is far better and more certain to have each machine separate to perform its own special work. The combination will not do the two things perfectly, only the one, the other an apology for it.

Having given a brief outline of the manner of projecting and producing animated pictures on the screen, the next point to consider is: What is its commercial value?

1. Commercially, providing exhibitors have a first-class and reliable machine with choicely selected films, they may rely upon doing a good business at all seasons.
2. By hiring same to private people.
3. By selling machine films and accessories.
4. By arranging, on loan, outfits to large stores and others for advertising purposes.
5. By cultivating a taste for this class of entertainment at institutions, bazaars, schools and evening parties. Any amount of business should be done in hiring during the usual festival seasons, upon reasonable terms of course, but the exhibition must be a good one and devoid of the flickering shutter, so distressing to the human eyes and temper. Any local event of unusual interest can be taken and shown. The exhibitor if he possesses a camera can take the subject on the spot, and so enhance his reputation.

Large business establishments last winter gave displays daily in order to attract and gain reputation, but unfortunately many were such wretched exhibitions through hiring fourth-rate itinerant showmen, that it rather detracted than otherwise. To be a pleasure, whatever is done must be done well and faultlessly. An exhibition of animated photographs perfectly rendered is a charming and fascinating thing that will attract all classes. People will come again and again to see these living pictures, so to speak, projected on a screen in a realistic manner full of animation and life. The writer and others are never tired of looking at them when a shutterless machine is used, but they are distracted, no matter how excellent the film is, if it be spoiled by the flickering of the dark shadow that is cast over the pictures by most shutter machines.

ILLUMINANTS FOR USE IN THE CINEMATOGRAPH.

THE ELECTRIC LIGHT.—This of course is the most powerful that can be used in the projecting lantern, but unfortunately it is not always available, and if it is, a suitable lamp must be used, according to the current at hand, otherwise failure will be the consequence; but providing all things are accessible—well, use the electric light, but not too strong if it be a small picture, for too much light is as bad as too little, but after a few trials and experiments the best results can be attained for either large or small pictures, but for all ordinary purposes the

LIMELIGHT answers best with a properly constructed mixed gas jet, say 1,500 candle-power; in fact, with a special code of lenses, from 16 to 20 feet pictures can be obtained even from the standard sized films. There are several forms of mixed gas jets on the market, also the blow-through jet will give very good results on, say, 6 to 10 feet pictures. There is not the slightest doubt that the best mixed gas jets are absolutely safe, particularly when gas cylinders are used, and altogether in many respects preferable to the electric light.

ETHER SATURATOR FOR ETHER-OXYGEN LIGHT having, so far, improved, is now a safe and reliable piece of apparatus for producing the ether-oxygen light in places where it is difficult to obtain hydrogen; it gives a brilliant light, and comes very near to the best oxyhydrogen light, and forms a valuable addition to the professional showman when travelling with a cinematograph machine, etc. The present form of saturators are absolutely safe, with one or two exceptions. These should be purchased from a reliable well-known practical man, and not from itinerant dealers. The only safeguard necessary is not to fill the reservoir with ether near an open light—safest in the open air, and then no danger can possibly arise—not as an operator did in Paris. It is absolutely necessary that the greatest precaution be used in every direction when dealing with volatile spirits, such as ether, petroleum, benzoline, etc. There are ether saturators on the market so primitive and flimsy in construction that unpleasant experiences have been the consequence. It behoves every user of a saturator to thoroughly understand the apparatus, and not attempt to use it publicly with a cinematograph machine until it has been mastered thoroughly in private. This is no more than ordinary precaution, therefore, with a good saturator, as suggested, no accidents will occur.

ETHER-HYDROGEN GAS in conjunction with oxygen makes a very brilliant light. As ether is readily obtainable anywhere, exhibitors will find it a great advantage to pass the hydrogen through a specially constructed ether saturator, which is sold for 30s. It saves quite two-thirds or more of the hydrogen, being very convenient while travelling about, instead of storing large cylinders of hydrogen, as a little of this in conjunction with ether goes a long way and answers admirably.

ACETYLENE GAS has been used for lantern purposes, and gives a light according to the number of burners used—about one-third the brilliancy of the ordinary blow-through jet. There have been several very serious accidents with it, but with proper care and with a scientifically constructed generator it may be considered comparatively safe; but there are many objections to it, and should only be used where it is not possible to obtain any other illuminant; far better to work the ether-oxygen light, as oxygen can easily be made either from an oxygen generator or used from a gas-bag. For small pictures, say 4 or 5 feet, very fair results may be obtained from the Pamphengos oil light, which is absolutely safe and the most perfect and brilliant oil light extant. This lamp is so well known that it requires little description here, but those not knowing its technicalities and value can have particulars forwarded post free by the inventor.

IS THERE ANY DANGER CONNECTED WITH AN EXHIBITION OF ANIMATED PHOTOGRAPHY?

None whatever!—that is, if fools are not allowed to step in where wise men dare to tread. Since the late Paris disaster many people have become a bit scared, but they need not, simply because they only look at things superficially and not theoretically, and do not take into consideration sufficiently the laws relating to cause and effect. Up to the present there have been no accidents in England of a similar kind. Accidents only occur through gross carelessness; for instance, if anyone is foolish enough to fill an ether saturator near an open light, of course there will be a flare-up, particularly if it be in a matchboard building, or if a person takes a lighted taper into a closed room to find out an escape of gas there must be an explosion, and so it is in every direction where individuals are dealing with combustibles, explosives, machinery, etc., etc. It is ignorance and want of knowledge that causes so much mischief in the world. A law should be passed to prevent inexperienced persons from dabbling publicly with things they virtually know nothing about. They should be compelled to pass an examination; failing this, if an accident occurs, they should be punished according to law, and that severely.

(To be continued.)

The Characteristic Effects of some Popular Developers.—II.

By **EDWARD DUNMORE.**

THE stain usually appears on the less exposed portions of the plate, and once started spreads over the whole of the film unless the development is discontinued. It is the frequent result of under-exposure and forced development, and so far as I know not remediable to any extent. A pyro-ammonia developed image is more amenable to after-treatment reduction or intensification than most other kinds. The colour of a pyro-ammonia image is generally inclined to a warm black, but varies with the amount of exposure. A full exposure and rapid well-restrained development increases the warmth of colour; a short exposure and long continued development, blackness; there is perhaps more variety of colour possible in negatives developed with this developer than with any other kind, also such that may be predetermined and repeated at pleasure, undoubtedly a valuable property nearly absent in other methods of development.

Pyro-soda comes next on the list of popular developers, and one that has received universal approval, and the reason is not far to seek. With this we get a much browner coloured image inclining to yellow than is possible with ammonia and the ordinary run of exposure. Now, as this colour is very non-actinic a thinner image will produce an equally plucky print; the action, too, is slower than with ammonia, consequently more under control, and in these days of rapid films when over-exposure is a prevailing fault, a decided advantage. Pyro stains are much less liable to occur, and plates that give green fog with ammonia are free from it with soda. At one time many makes of plates could not be developed with ammonia without the production of this objectionable effect—green fog, especially those intended for ferrous-oxalate developing, once the universal method on the Continent, but never very popular on this side of the Channel. The soda compound remains clear a much longer time after mixing and is exceedingly pleasant to work with. For portraiture it is especially suitable, the modelling of a well-exposed portrait negative being simply perfection; it is for this purpose that a thin negative of non-actinic colour is particularly valuable, as we get a rapid printing with soft and plucky images, and prints from them that will bear toning well without danger of becoming flat and poor during the process. The chief drawback to this developer is the tendency to hard negatives when the development is much prolonged, and the difficulty of reducing them without destroying the half tones. An under-exposed plate forced with pyro-soda is rarely as satisfactory as one developed with ammonia, as a very trifling addition to the density of the lights has more than a corresponding effect on the printing;

another peculiarity

with soda developed negatives is the tendency of them to become denser in washing, after being left in the water a few hours; this does not always occur, but still, may be catalogued as a drawback. It is probably owing to the greater difficulty of removing the hyposulphite of silver from the plates by the perfunctory swill they usually get before putting to soak, as the films seem less porous than when ammonia is used and consequently more retentive of any salt that may remain in them.

The great uniformity of the pyro-soda developer is much in its favour, being altogether independent of changes of temperature, which cannot be said of the ammonia compound, which is continually varying in hot weather. This characteristic is important when there is a press of business and negatives are taken as rapidly one after the other as the plates can be exposed. Take it altogether, pyro-soda is equal to any for studio work, although I fancy a little behind pyro-ammonia for landscape and interior subjects. Very much, however, depends on the worker and his familiarity with the special form of developer used.

Ferrous-oxalate development in some hands will produce most excellent results, but in all cases the resulting image is of coarser grain than with the already mentioned developers. For a long time it was *the* developer used on the Continent almost to the exclusion of all other kinds. It is particularly suitable for large work or for negatives intended for carbon printing; the entire freedom of the image from yellowness or stains is much in its favour, the colour of the image is a warm black, much resembling a good wet collodion negative, and in some cases it is difficult to tell the two apart. It, however, requires considerable practice to work it to the *best* advantage, and it will not permit much control in case of varying exposure, but given a correct exposure a good negative will result. In the matter of cost this developer is somewhat more expensive than the previous ones; this is but a small matter when good negatives are the desideratum. But whatever the reason, ferrous-oxalate development for *negatives* has never been very much used in this country, but for bromide paper it retains its popularity and is almost universally adopted, giving nice rich velvety prints (somewhat warmer in colour than hydrokinone, its almost only rival) and clear lights; its chief drawback is the facility with which it stains the paper if used carelessly or in unsuitable proportions. Hydrokinone is, I think, the next developing agent in popular esteem, and for certain purposes exceedingly useful; it works clear and bright and so commands itself for

lantern slide work;

it has, at the same time, a tendency to give hard images. It will, however, remain in solution with potassium hydrate for a long time unchanged and will give good results months after preparation. The ready-made one solution developers are, most of them, compounded with hydrokinone, or quinol as it is frequently called. It forms a most excellent developer for bromide paper, working in a particularly clear and satisfactory manner, leaving the whites pure, at the same time producing good velvety shadows, although somewhat inclined to coldness of tone. Caustic potash has been found the most suitable alkali to use with this substance, although both carbonate of soda and carbonate of potash will be found to work fairly well. It requires a certain proportion of sulphate of soda with it, as do all this class of developing agents without exception. Amidol will, perhaps, work with as little of it as any, but in all cases it is a decided improvement, as without it the solutions very soon discolour and become unsuitable for development. For negative work hydrokinone alone gives an image with a less scale of tone than some other kinds of developing agents, and therefore, to my thinking, is not quite so suitable for portrait and landscape work; the development requires carrying somewhat farther than with either of the first-named developers, as owing to the freedom of the image from any trace of yellowness, its resistance to light is less; therefore, requires more apparent density to make up for it. Metol is a substance possessing qualities in which hydrokinone is deficient, giving abundance of detail in the weakly-lighted portions of the subject, but lacking somewhat in density, unless the image is rather under-exposed, when a fair amount of printing power is easily acquired, but at the loss of its specially good quality of evolving detail from the shadows. If, however, it is combined with half the quantity of hydrokinone and carbonate of soda used as the alkali we gain the good qualities of each substance without any drawbacks so far as I am aware, each supplying the shortcomings of the other. With *correct* exposure this combination is hard to improve upon, but in case of unknown exposures, especially over-exposures, it is not quite so easy to get a *first quality* negative by tentative development. Reduction and subsequent intensification will have to be resorted to if there is much over-exposure—an under-exposed plate is more amenable to treatment, a *long continued action of the much diluted developer* will get out as much, or more, detail as is possible to be evolved by any developer; the *proportions* of the constituents of the solution remaining unaltered, the addition of water being all that is required. This developer in a concentrated form makes **very dense images**; in fact, unprintably so, but when used of a suitable strength the density and detail come out together in a very harmonious manner.

Rodinal and eikonogen are much the same in working qualities, their density-giving power depending much on the strength of their solutions, and are useful for developing images impressed by weak light and rapid exposures. Rodinal is a developer supplied as a liquid preparation requiring nothing but the addition of water; for use, it is therefore a convenient form for travellers, a small bottle taking up little room and giving a minimum of trouble in mixing for use. Eikonogen is sold as a brownish coloured powder, eventually becoming quite black if air is allowed to have access to it and losing its powers of development; still, when fresh, it is a favourite with some workers and gives good modelling, although the images are inclined to thinness; the colour of the image is rather warmer than that produced with hydrokinone. Glycin is one of the more recently introduced chemicals for development and is highly esteemed by some workers. Nearly all these developing agents have an alkaline reaction and some will develop an image without the addition of other alkali; therefore, acids such as used for the preservation of solutions of pyrogallol are unsuitable. With the exception of hydrokinone the alkali used renders the developing agent much more soluble in cold water as without it, although by heating it may be dissolved, on cooling it will be a great part again precipitated. Sulphite of soda is an absolutely necessary addition to this class of developer, for without it an almost immediate discolouration takes place. The solubility of these preparations by different makers vary somewhat, and also the colour of the solutions, although their action is nearly the same.

Tables as Lantern Stands.

By F. J. SCRIMGEOUR.

HOW far it is proper to trust to luck in lanternism depends upon the idea of the lanternist. The travelling operator has, as a rule, more to do with Dame Fortune than he cares; and often sincerely wishes he could tip her well beforehand. But to that she will not stoop, and centre gas brackets, monstre chandeliers, and distorted structural deformities have to be fought and conquered as they appear.

How often do we have to guess the size of the hall to which we are going, and pack up our 12 feet screen in hopes that it will be neither too large or too small? And how often do we arrive to find that an 18 feet sheet would have been more in keeping with the capacity of the hall? Well, I suppose almost as often as we find ourselves at a hall in size adapted to a tenfooter!

At present there are two methods possible, either of which may be used to eliminate the element of chance. The first is, to proceed thither sometime previous to the date of exhibition and make a personal examination; the second consists partly of a note to the hall-keeper or some other responsible party requesting measurements, and partly of the figures, etc., received in answer to the request. The first method is very satisfactory if convenient (which unfortunately it is not, as a rule). The second has its disadvantages, for a chandelier, charmingly innocent in the eyes of the caretaker, may be a very demon when seen through a lanternist's spectacles. Even his measurements may convey a false impression unless you have the "gumption" to enclose a "form" to fill up. I sometimes wonder if it would not be possible for some influential paper, such as our OPTICAL MAGIC LANTERN JOURNAL, to compile a list of all the chief halls in the United Kingdom, with their respective capacities and principal measurements. Were our editor to see his way to publish monthly a list of halls, I am sure we lanternists would rally round and send in our contributions of reliable figures. Such a list, when completed, would form a set of measurements of the greatest value to the brotherhood.

When the above is an accomplished fact, a set of statements regarding the condition of the legs of the moveable tables in these halls would receive a hearty welcome from many—myself included! I once heard two friends wax warm, or should I say eloquent, over the question as to the most convenient size of

table for a single lantern

and slides. The debate had no interest for me. I had learned long before to ignore convenience or inconvenience of size, and be thankful for any table possessed of steadiness in its legs. Is there, I wonder, some hereditary disease of the lower extremities or hip joints, which appears in an exaggerated form in public hall tables? When the legs are unequal in length, or the floor uneven, a thin wedge of wood or paper will give sufficient steadiness; but that plan is no remedy when the whole table is rickety! "Rickets" is a very common disease.

Although steadiness comes before size, yet the latter is also worthy of much consideration. Too large a table is a nuisance to everybody; it takes up a lot of room, and in a full house forms a large unoccupied gap in the centre, which is, to say the least of it, unseemly. There is also a great temptation to spread out effects and appliances, of which, if yielded to, the operator will repent when the lights go down. On the other hand, if too small, matters are even worse, for the slides are in imminent danger, and if they meet with any accident, things will be in a bad way. A comparatively small space is sufficient for the slides when the lecture set is a straight "go-ahead" one, and each slide leaves its groove in the slide box only for the few minutes its services are required, and it is returned to its original place. In such cases, room for more than the bottom of the slide box is almost superfluous, unless perhaps a corner somewhere for an extra lime, a duster, and a ball of string for emergencies. But such "close shaving," or, in a Scotch term, "scrimping," of available surface would never do when an elaborate effect set is in use. Plenty of room is essential then; for the rackworks cannot be all boxed together with convenience, and henceforth a systematic method must be used to keep each "family" separate, and handy to the operator. When the effects occur at intervals only, a portion of the lantern table is quite good enough, and on it the "families," or sets of slides for each effect, should be arranged from, say, right to left. Each small effect "family" should have its members so arranged, one on the top of the other, that the first slide required is on the top, and that the correct order is kept.

Personally, when using some sets for my triple lantern, which are composed of almost continual effects, I insist upon a separate table for slides only. This table I place in front of me, and at right angle to the lantern stand, so that I operate between the arms of a right angle. My lantern stand has a shelf which I use to hold the spare limes, lime tongs, and cylinder keys, etc. This leaves the extra table for slides and rackworks entirely, which are then in a most suitable and convenient position. The lantern stand I have mentioned, is, of course, part of the plant, and is almost essential for large apparatus. Its construction is both novel and neat, but a description of its advantages remains over for publication on some future occasion.

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A Plea for Softness in Lantern Slides.

By T. PERKINS.

THERE is little doubt that a great number of the lantern slides that are exhibited err considerably on the side of over-brilliancy, and unfortunately there is also no doubt that these slides please a majority of those who attend lantern lectures.

We are told that a perfect lantern slide should show clear glass for the highest lights, and not be so heavy that even the deepest shadows are completely blocked up. And with this description of a perfect slide we have no cause to quarrel, it is in the way in which this description is understood that the error creeps in. We often see a slide in which quite half the area is clear glass, but who will say that this is a true representation of nature? What artist working in monochrome would think of leaving half of his paper entirely blank? And we must remember that there is a far greater range of light in the picture shown on the lantern screen, if the illumination is good, than can ever be obtained in a picture, whether it be a wash drawing, an engraving, or a photographic print, produced on paper.

Ruskin somewhere describes an experiment, the result of which if tried would be a surprise to most of our readers. The experiment may be performed somewhat in this way. Go out into some open space on a day when the sky is overcast, with a piece of white drawing paper, and hold it a little above the level of the eyes so that it may obscure part of the sky near the horizon, placing it so that its upper surface may make an angle of about 135° with the line drawn from the eyes to its lower edge. The surface will then be as well illuminated as possible, and yet it

will appear distinctly

darker than even the grey clouds behind it, showing that the highest light that can be obtained on white paper, if the sun is not actually shining on it, is far lower than the light of even an overcast sky; and notwithstanding this, the artist makes his highest light very precious, leaving often not more than an area equal in size to the capital O in the word "Optical" at the top of this page absolutely white paper, and yet the maker of a lantern slide does not hesitate to leave half the area of his slide absolutely clear glass, which, when the slide is projected on the screen, will be represented by a far brighter light than is obtainable in any picture on paper. The slide maker has the power, if he will but use it properly, of giving a far more truthful representation of the illumination of nature than any artist working on paper.

Let us go out into the open air and carefully study the lighting of any piece of natural scenery, and we shall be struck with the small amount of the landscape that can with truth be represented by clear glass on a slide. The sun itself, save under peculiar circumstances, such as when he is shorn of most of his brilliancy by fog or the mists of early morning or late evening, will never be represented in a photograph, so that the highest lights capable of being represented will be the silver lining of some cloud, or the sparkle of sunlight on the sea, or some white object illuminated by the direct rays of the sun.

In an ordinary landscape or architectural subject none of these exceedingly bright objects will be seen; hence in an ordinary slide no part ought to be absolutely clear glass, therefore it is well to bear this fact in mind when developing the transparency to be used for purposes of projection. On the other hand, we seldom, if ever, find absolute blackness, even the darkest parts of objects covered with the blackest of paint or tar reflect some light, the only perfect blackness that we meet with in nature is the yawning mouth of some deep chasm in rocks in the immediate foreground. Hence, while avoiding clear glass for our highest lights, we must take care that the deposit in the deeper shadows is not so dense as to be impenetrable by the light from the lamp of the lantern. To secure both of these requisites the production of the negative as well as of the slide must be carefully attended to.

Only the smallest part, if any, of the negative must be clear glass, otherwise we shall obtain shadows in our slide devoid of detail. We believe that a somewhat fully exposed negative with plenty of detail, kept purposely thin in development, one that will give a soft print on P.O.P., is the ideal negative to be used for lantern slide making.

Colour sensitive plates

used with a screen certainly have a great advantage, and it would be well if those who make negatives solely with the view of producing slides from them, would use these, and strive to obtain negatives such as those described above.

One great reason for the badness of so many of the slides we see is the unsuitability of the negatives from which they are made. As the light scale of a paper print is so much shorter than that of nature, the photographer who wishes to print on paper from his negatives naturally aims at getting strong contrasts to prevent his prints being flat, and exposes and develops his negative so that his prints may possess vigour; but he must remember that though by care he may be able to get from such a negative a passable slide, yet he will not reach the highest attainable point of excellence unless from the time that he uncaps his lens for the original exposure until the slide is finally made he bears in mind the ultimate object at which he is aiming—a perfect lantern slide. If all lanternists would bear this fact in mind, the result would be a great rise in the standard of our lantern exhibitions.

Toning Bromide Prints.

By **EDMUND A. ROBINS.**

THERE seems to be a great tendency at the present time to wish to modify the usual cold tones of bromide paper, and it is the purpose of this article to show a number of methods whereby this may be done; and although the permanency cannot always be guaranteed, a few words on the methods in vogue at the present day may do good in suggesting to others the direction in which to experiment for themselves—a thing which is greatly wanted in photography; then, perhaps, some reliable toning method for bromide paper may be discovered. The tones directly produced by development vary very slightly, and experiments I have made with every developer upon the market except the very latest ("Ortol") have produced no results, showing very little can be expected from this direction, glycin and rodinal giving slightly warmer images, but not sufficient for the purpose. The addition of various substances to the developer, as recommended in an article in the *British Journal of Photography*, September 24th, 1897, also gave negative results. The first toning bath of any importance is that of hypo and alum, or sulphur toning, mentioned in a previous article of mine in the MAGIC LANTERN JOURNAL, but which I take the liberty to repeat in order to make this article more complete. This depends upon the formation of a brown silver sulphide, which after three years' trial has proved to be permanent. The brown image even resists chlorine water—one of the most powerful bleaching agents known. The bath is composed as follows, and is suitable for all classes of bromide papers :—

Hyposulphate of soda	46 ozs.
Alum (common)	5 ,,
Water (hot)	320 ,,

This is heated to about 120 deg. F. before immersing the bromide prints, which must have previously been through an alum bath after fixing, but need not have been washed. It gives a sepia tone, varying with the class of negative, on brown tinted bromide papers, such as the new "Royal" bromide paper, manufactured by the Eastman Company; tones resembling brown carbon can be produced, the resemblance being so great as to deceive even experienced carbon workers. The next in order of permanence is uranium, the permanency of which greatly depends upon the care with which the manipulations are carried out. The well-washed prints are immersed in the following solution until the required tone is reached :—

Potassium ferricyanide	10 grains.
Water	10 ozs.
Add glacial acetic acid	4 drams.
Uranium nitrate solution (10 %) ..	2 ,,

The mixed solutions will not keep They will keep separately, providing the ferricyanide is kept from the light, although after a time this deteriorates. After toning, the prints are washed in running water until all trace of the yellow ferricyanide is removed. Care must be taken to prevent them sticking together, and also to prevent the water from playing too long in one place, else stains are produced. Prolonged washing will remove all the toning. A very pleasant effect is produced, in suitable subjects, by immersing the washed uranium toned print in :—

Ferric chloride	1 part.
Hydrochloric acid	2 ,,
Water	300 ,,

This changes the print to a sea-green colour, and by stopping the action at various points brown shadows with green highlights can be produced, giving rather a pleasant effect. The prints are slightly rinsed before drying. Bromide prints may be toned a brilliant blue colour by placing in the following bath, the print having been thoroughly freed from hypo :—

Ferric oxalate	5 grains.

Dissolve in a saturated solution of oxalic acid as small a quantity as possible, then add :

Potassium ferricyanide	5 grains.
Water to..	20 ozs.

The prints which are of a brilliant blue colour can be cleared by immersing for a few minutes in a 2 per cent. solution of hydrochloric acid, and may be turned violet by placing in a 2 per cent. solution of ammonia (·880). By bleaching the image in the following bath :—

Potassium bichromate solution (5 %)	10 ozs.
Hydrochloric acid	2 drams.

the print bleaches to a light cream colour, and it then must be washed until all the yellowness has disappeared. A solution of Schippe's salt (theo-antimoniate of soda), 15 grains to the ounce, is then poured over it. The image at once assumes a colour approximating to a Bartolozzi red. The print must then be washed until all yellowness has disappeared. In this case, as the action is of an intensifying character, the print must not be developed so far as is usual. A red tone may be obtained by flooding the print with the following solution :—To a 1 per cent. solution of copper sulphate is added a saturated solution of ammonium carbonate until the precipitate first formed is redissolved, then add potassium ferricyanide in the proportion of 3 grains to each ounce of solution. The prints tone to a red colour in this bath, but the permanency cannot be guaranteed, as a copper sulphide is formed on the surface of the print, due to the action of the sulphuretted hydrogen always present in small quantities in the air of towns. They can be preserved under glass for a considerable time, and the permanency is improved by cleaning with a 2 per cent. solution of ammonia (·880), or a saturated solution of potassium oxalate. A variety of tones can be produced by bleaching the print with a solution of chlorine gas in water, and redeveloping with various developers in daylight—a process which was communicated to the R.P.S. by Mr. H. Senier. The above remarks apply to all gelatino-bromide papers and opals, and I hope that they will fulfil the wish given at the beginning of this article, and stimulate experimentalists to seek for an improved toning method, as the toning of bromide prints is in a very early stage of development.

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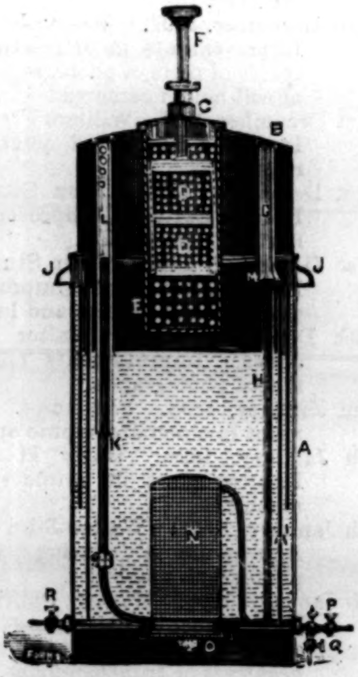
NEW APPARATUS.

THE "FOWLER" ACETYLENE GAS GENERATOR.

This generator has been placed on the market by the Fowler Acetylene Gas Company, 298, Marsh Lane, Bootle, Liverpool. It is constructed on scientific principles, and is strongly made. The following sectional illustration will serve to give a good idea as to its mode of working. A represents the water tank, which it will be seen is divided into two compartments so that the water on which the gasometer floats is separate and distinct from that by which its action on the calcium carbide causes the gas to be evolved. The gasometer or bell float is shown at B ; the carbide carrier D, which is attached to the rod F, is admitted into the perforated case E at C, which is provided with a screw cap. Should the apparatus become overcharged through inattention, the surplus at once escapes *via* the safety tubes G and H. The apparatus is provided with two handles at the sides marked JJ. The gas passes down the pipe K, and is conducted to the cooling chamber N, which is surrounded with water, and contains purifying materials. Access to this chamber is obtained at the screw plug O. The rubber tubing which connects with the burner is attached at P, whilst any moisture contained in the piping can be drawn off at Q. Waste air is allowed to escape by means of the tap R. The carbide container is divided into two, the better to keep a portion of the contents dry until that contained in the lower receptacle is used. These containers are pushed down a little at a time as required by means of the rod F, and the machine itself is automatic in action. Several sizes of apparatus on this same principle are manufactured by this company.



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LANTERN SLIDES.—We have received from Mr. John Stabb, of 152, Kensington Park Road, Bayswater, samples of the slides which he advertises. Those which we have received are crisp, of good tone, and the subjects well selected.

PATENT INTELLIGENCE.

The following List, relating to current Patent Applications, is compiled expressly for the "Optical Magic Lantern Journal" by W. P. Thompson & Co., Patent Agents, of 322, High Holborn, London, W.C., to whom all enquiries for further information should be addressed.

No. RECENT PATENT APPLICATIONS.

29616. 14th December, 1897. Henry William Short. A new or improved holder or casing for book form kinetoscopes.

29694. 15th December, 1897. Alfred Summers. Device for instantaneously changing slides for magic and other view or picture projecting lanterns.

29947. 17th December, 1897. Henry Joseph Redding. Improvements in or relating to the film spools of reels of photographic roll-holders or roll-holder cameras.

30151. 21st December, 1897. William Frederic Butcher. Improved animated photograph apparatus.

30246. 21st December, 1897. John Stuart and John Henry Barton. Improvements in arc lamps for projection.

30247. 21st December, 1897. John Stuart and John Henry Barton. An improved centering motion for arc lamps and limelight jets.

30815. 30th December, 1897. Walter John Hubert Jones. Improvements relating to animated photographs.

72. 2nd January, 1898. Birt Acres. An improvement in cinematographic apparatus.

441. 6th January, 1898. Harry Hamilton Moon. Improvements in animated photograph machines.

442. 6th January, 1898. Walter John Hubert Jones. Improvements relating to animated photograph machines.

499. 7th January, 1898. William Phillips Thompson. Improvements in negative enlarging cameras and cameras for printing from negatives or transparencies.

681. 10th January, 1898. W. C. Hughes. Improvements in and relating to projecting apparatus and cameras for kinetoscopic pictures.

717. 11th January, 1898. P. J. Jackson. A new or improved slide carrier for magic lanterns and similar apparatus.

721. 11th January, 1898. J. Trotter. Reserved motion in kinematograph pictures.

990. 13th January, 1898. J. Peschek. Portable cinematograph.

SPECIFICATIONS PUBLISHED.

Copies of the following specifications may be obtained by remitting 1/- for each specification to W. P. Thompson & Co., Patent Agents, 322, High Holborn, London, W.C.

1039 of 1897. Obelt. Projecting kinetoscope pictures.

14905 of 1897. Sefton-Jones (Mace). Acetylene gas production.

11163 of 1897. Coles. Oxyhydrogen jets for limelight and other purposes.

13415 of 1897. Wagner, Williams, Brown, and Earle. Mounting for and arrangement of lenses for use as a magnifying glass or magic lantern objective.

27767 of 1897. Schülke. Acetylene gas generator.

28094 of 1897. Tyree. Acetylene gas generator.

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Editorial Table.

"THE HERALD OF RYE."—The first number of this monthly is to hand. It is written and published by Mr. Harry Davis, of 12, High Street, Rye, Sussex, for the interest of the inhabitants and the attraction of visitors. The intention is to issue two portrait supplements of prominent men of the town with each issue. If the subsequent numbers are of the same interesting style as the copy before us, the magazine should speedily find a good place for itself. A prize of 10s. is offered for photographs of various parts of the surroundings of the town. We would suggest that the date of issue be printed on the magazine, this being entirely wanting in the number which we have received.

"ANIMATED PHOTOGRAPHY." By Cecil M. Hepworth. London: Hazell, Watson & Viney, 1s.—This book is a sort of A.B.C. of the cinematograph, although we observe the entire absence of any credit to Mr. Friese Green, the first account of whose apparatus appeared in the MAGIC LANTERN JOURNAL and was from that source quoted in most of the daily papers in November, 1889. Various forms of intermittent mechanism are described and illustrated, modes of illumination, the taking of negatives, and treatment of films, form the subject of interesting chapters, and a perusal of the book cannot fail to impart information to those who take an interest in the mechanics of animated photography.

——:o:——

Correspondence.

MOUNTING LANTERN CONDENSERS.

To Mr. J. Hay Taylor, Editor.

DEAR SIR,—I shall be glad to have opinions in the columns of the OPTICAL MAGIC LANTERN JOURNAL if there is any real necessity for mounting lantern condensers loose? I know it is commonly thought necessary to do so, but is the practice founded on solid reason? I find that under heat, brass expands much more than glass; therefore, will not the rings or case holding the lenses grow looser when the lantern is in use?

I would like to have your experience and that of your readers, who are old hands in the use of the lantern, on this point. My own experience lately bears out the theoretical proposition that the lenses need not be loosely mounted. Of course, it is highly desirable that the lenses be easily removed from the case, and my query is not as to that, but merely as to the degree of tightness with which they should be held when in use.

I trust that you will be able to give me, or put me in the way of getting, some practical information on the point stated.

Yours, etc.,
"A READER."

CARELESSNESS OF DEALERS.

To Mr. J. Hay Taylor, Editor.

DEAR SIR,—I was very glad to see the letter by Carradog in your last number of the MAGIC LANTERN JOURNAL, for I am of the opinion that carelessness is easily curable, and a slight touch up in this direction does good to dealers and others, on the principle that it is only one's best friends who will point out one's faults.

We all make mistakes at times, and why then should a dealer in lantern apparatus be considered infallible; at the same time it is desirable that the making of mistakes should be reduced to a minimum, and such can be easily remedied. For instance, in the case cited by your correspondent, it appeared that a cylinder of gas and a key for same were ordered. It is presumable that in the rush of business a key was simply taken from the drawer, or other receptacle for such, and at once attached to the neck of the cylinder, this perhaps would be all right if wear was not taken into consideration; it would have been the work only of a moment for the assistant to have tried the key on the valve, and this I may say is very necessary. I have seen hired cylinder keys used for many purposes for which they were never intended, such as a hammer, a wrench, etc., and with such rough treatment it is not to be supposed that the key will last long for the purpose for which it was originally intended, so I would suggest that even returned keys should be looked to by the dealer on their return, ere they are placed into stock. A share of blame rests with the correspondent spoken of also, for no good operator would take everything for granted; everything should be seen to be adapted to its surroundings, and the misfit of the key should have been found out long before the time of commencing the exhibition and the next best tool immediately obtained. Had Carradog been anything of a mechanic he could have inserted a narrow strip of brass or other metal in the key so as to make it better fit the spindle. I have no desire to hint that the correspondent alluded to was not a capable operator, but I will say that I know many persons who consider themselves capable operators, who usually make a hash of their exhibitions, and this in spite of the apparatus being thoroughly reliable; yet when the slightest trouble arises they at once look round to which part of the apparatus they can fasten the blame.

Yours truly,
A LANTERN OPERATOR.

ETHER SATURATORS.

To Mr. J. Hay Taylor, Editor.

DEAR SIR,—I had hoped that some more able exponent than myself would have taken up the cause of the saturator with reference to the letters in recent issues of your journal. I have no interest direct or indirect in anything to which I may refer, and am only an amateur lanternist, manipulating in our own town for various societies connected with the parish church, one of which owns the lantern used. Part of last season, and the whole of the present up-to-date, I have used the single or large portion of a Lawson bi-unial saturator, and since October 1st have given 17 exhibitions, the pictures varying from 10 feet to 18 feet; distance from screen 20 feet to 60 feet, according to capacity of different rooms, and in every case the light has been pronounced splendid and perfectly quiet—so much so that a friend who witnessed an exhibition a few days ago, and who is interested in lantern work in the south, expressed his intention of advocating this system in preference to the mixed jet (not blow-through) which they now use.

As the quantity of ether burnt varies slightly on different occasions, I have found the following idea most valuable:—Having determined by experiment when the saturator was quite full and would light evenly, I weighed it as charged, and on each succeeding occasion place the same weight (gross) on the scale; then pour in gently till balanced. This is a much more accurate system than measuring, although if preferred a measure may be used to pour from and the quantity known, but the weight must rule. If this is done, I do not see how any misfortune can occur.

With regard to Mr. Downe-Shaw's experience, the saturator might light up when level, but if at all overcharged, when tilted to focus, the surplus might flow back, and thus cause the light to vary.

I append my name and address, so that the above may be verified if desired, and apologise for thus troubling you.

I am, dear Sir,
Yours truly,
JOHN HOLMES.

164, Catherine Street,
Doncaster.
January 15th, 1898.

COMPLIMENTS AND COMPLAINTS FROM AUSTRALIA.

To Mr. J. Hay Taylor, Editor.

DEAR SIR,—For several years I have been a subscriber to, and careful reader of your excellent magazine. I have found it most helpful in my work as honorary conductor of our lantern mission. It has brought me fully "up-to-date" in reference to all new developments, and made me feel myself in touch with fellow workers in the old country and elsewhere. I have also found your advertising columns very interesting and useful. Many of your advertisers are represented in my outfit, which, in addition to limelight apparatus and other things obtained locally, includes one of Hughes' Pamphengos lanterns, Thorne & Hoddle's Acetylene generator, and slides from Newton & Co., W. Tyler, Chatham Pexton, A. Underhill, T. T. Wing, R. H. Clark, and Graystone Bird. All these have supplied me with goods excellent in quality and moderate in price. On two occasions, however, I have sent home money for slides with less happy results. About four years ago I sent a P.O. order for 10s. to a Mr. ——— for some samples of film slides. After a few months, finding the slides were not forthcoming, I sent a letter of enquiry, but have never received any answer yet. In the early part of the present year (1897) I sent a P.O. order for 24s. 3d. to a Mr. ——— of ———, with an order for 12 slides at 1s. 6d. and two at 2s. each (the odd 2s. 3d. to cover postage). Finding that the slides were not forthcoming I wrote (August 10th) a letter of enquiry. This should have been delivered in ——— about September 15th, but, although mails up to about October 22nd have now been delivered in Melbourne, I have received no reply. So, I suppose, I have to add the loss of this 24s. 3d. to the other 10s. that I sent. It seems a strange coincidence that these two mishaps should be in reference to orders to this one place, although to different persons. I cannot help wondering whether my losses are the result of neglect, or of dishonesty, or of some strange mischance. The fact, however, that in neither case have I received any reply to my letters of enquiry makes me, I think, not unnaturally suspicious. At all events I have, it seems, lost all my money. *Hinc illæ lacrimæ.*

Why do I trouble you with these complaints? Mainly on account of your very kind and sympathetic article on "Colonial Lanternists" in the issue for October (the last I have received). You see we have other difficulties in obtaining supplies besides those you have enumerated. It is, of course, a great advantage to be able to obtain goods from the old country, as the stocks of our colonial dealers are necessarily limited, and many of our lanternists, living in country districts, would find it as easy to write to England as to Melbourne or Sydney, but if sending home money means its utter loss, and even our enquiries regarding it remain unanswered, confidence is naturally destroyed. It seems to me, therefore, that such mischances as have happened to me would tend to injure the prospects of your advertisers of obtaining orders from the colonies, and the opening up of the line of trade referred to in your article. I certainly, for one, do not feel inclined to run any more risks unless the mystery is cleared up, especially in regard to the last order I have mentioned. Having thus unburdened myself in regard to my troubles it only remains for me, on behalf of my fellow workers in Australia, to thank you for your sympathetic remarks as to the trials and difficulties which beset the course of the

COLONIAL LANTERNIST.

Bridport Street, Melbourne,
Victoria, Australia,
December 3rd, 1897.

[Both of the firms mentioned are thoroughly reliable, and in consequence we have omitted the names. Four years ago is rather far to go back, but we have written to the second party mentioned and he at once replied to us to the effect that he wrote to you twice and is still awaiting instructions (two slides mentioned were not on the market) as to a substitution of slides, or a return of a part of the money. He is writing you again.—ED.]

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Notes and Queries.

J. W. Seers.—We shall be glad to have a reading of the manuscript at your early convenience.

N. Y. N.—We have repeatedly dwelt on this question, and you will find much information in our back numbers. We cannot say one is better than the other, for the conditions are different. If you want to use your own pet jet, 1 is about as good as 2, but if the jets form a part of the apparatus there is practically nothing to choose between 3 and 4.

Photophil.—You do not say whether you want the pictures to be projected in the open air or in a building; if the latter, dense smoke will certainly be somewhat objectionable. In this case you will find steam preferable. A horizontal pipe with small holes at intervals should answer if you have a good pressure of steam at command. If you merely want to make a smoky fire outside, make a good fire; then when well alight throw on a supply of green twigs, branches, or other refuse. Would not Bruce's aerial graphoscope suit your purpose? See the advertisement in this or last journal.

J. H. writes:—Will you please inform me whether any estimate of the candle-power of the incandescent gas light, as compared with the 3 and 4-wick mineral oil lantern lamp, has been made. *Ans.*—Yes, and if you refer to this journal for April and May last, you will find plenty of statistics on the subject.

S.—(1) The average service of a Beard's regulator may be considered at about 2½ lbs. per square inch, or 60 inches of water column. (2) We cannot answer your question off hand, and we would suggest that you try the experiment yourself with a long U shape tube, after the style suggested in an article in this issue. An ordinary working pressure would be about 14 or 15 inches of water.

W. Heath writes to the effect that he has in the past only used a single lantern, but is now going in for a bi-unial, and wants to know how to connect up the dissolving tap. *Ans.*—For this we must refer him to an article in this journal for June, 1896, where full particulars and illustrations are to be found.

R. G. Wheeler writes:—On first page of journal for January, 1897, you had a note on accumulators. I have looked for further notice of those alluded to, but have not seen any. I am sure such would be welcomed by many of your readers. *Ans.*—We, too, have been expecting to hear from the party who made the promise, but, so far, have not heard. However, we will remind him about it.

G. E. S.—The first-named jet we know to be good, but the second we have not yet tried, for the simple reason that the manager at Manchester, to whom we have written three times, has promised to give us an opportunity of so doing, but has not yet fulfilled his promise. We do not know the consumption of gas in each case. A letter to the makers would probably bring you the desired information.

S. R.—The various stops of single achromatic lenses are of the same value as those of a rectilinear lens; thus f 8 would in either case be one-eighth of the focus.

T. W. Camp.—Thanks for your letter, we will write to the reverend gentleman.

Exhibitor.—We do not know any firm who would be willing to entrust you with the rolls of cinematograph film on hire, changing them when your audiences are tired of the particular subjects; but you might put yourself in communication with Mr. Philipp Wolff, 9, Southampton Street, London, W.C. We think he at one time contemplated hiring out films, but do not know whether he carried it into effect.

N. R. asks:—"Where can I purchase a biograph animated outfit—I mean the apparatus used at the Palace of Varieties in London." *Ans.*—This apparatus is used exclusively by the proprietors, who do not sell it.

Lens.—All your questions, and many others besides, will be found answered in the article on page 20 of this issue, about testing lenses.

N.—Judging from the description, the lantern is of French or German make. Your letter is incomplete, inasmuch as you leave off in the middle of a question and then begin a new paragraph.